Chemical/Biological Terrorism
September, 2003

1: Am J Clin Pathol. 2003 Jun;119 Suppl:S78-85.
Yersinia pestis and the plague.
Rollins SE, Rollins SM, Ryan ET.
Department of Pathology, Massachusetts General Hospital, Harvard Medical School, Boston, MA, USA.
Yersinia pestis is the cause of plague, an illness that may manifest in bubonic, pneumonic, or septicemic form. Plague has killed an estimated 200 million humans throughout history, and plague is endemic in many areas of the world. Approximately 2,000 cases of plague are reported each year to the World Health Organization, and concern has been raised about the possible use of Y pestis as an agent of bioterrorism. The genome of Y pestis has been sequenced, including the 3 virulence plasmids, pPst, pLcr, and pFra, and advances have been made in understanding the bacterial pathogenesis of Y pestis infection. Advances also have been made in rapid diagnosis, the understanding of immune responses during plague, and vaccine development.
Publication Types: Review Review, Tutorial
PMID: 12951845 [PubMed - indexed for MEDLINE]

2: Am J Epidemiol. 2003 Sep 1;158(5):457-67.
Gulf War veterans and Iraqi nerve agents at Khamisiyah: postwar hospitalization data revisited.
Smith TC, Gray GC, Weir JC, Heller JM, Ryan MA.
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Chemical warfare agents were demolished by US soldiers at Khamisiyah, Iraq, in March 1991. The authors investigated postwar morbidity for Gulf War veterans, contrasting those who may have been exposed to low gaseous levels of nerve agents and those unlikely to have been exposed. Cox regression modeling was performed for hospitalizations from all causes and hospitalizations from diagnoses within 15 categories during the period March 10, 1991, through December 31, 2000, for the duration of active-duty status. After adjustment for all variables in the model, only two of 37 models suggested that personnel possibly exposed to subclinical doses of nerve agents might be at increased risk for hospitalization from circulatory diseases, specifically cardiac

dysrhythmias. Of the 724 hospitalizations for cardiac dysrhythmias, 203 were in the potentially exposed group, slightly higher than expected (risk ratio = 1.23, 95% confidence interval: 1.04, 1.44). The increase was small in comparison with potential observational variability, but the findings are provocative and warrant further evaluation. Veterans possibly exposed to nerve agents released by the Khamisiyah demolition were not found to be at increased risk for hospitalizations from any other chronic diseases nearly 10 years after the Gulf War.
PMID: 12936901 [PubMed - indexed for MEDLINE]

3: Am J Epidemiol. 2003 Jul 15;158(2):110-7.
Transmission potential of smallpox: estimates based on detailed data from an outbreak.
Eichner M, Dietz K.
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Recent discussions on the use of variola virus by bioterrorists have rekindled interest in the parameters that govern the transmissibility of smallpox. Here, the authors estimate by maximum likelihood the parameters of the spread of smallpox from historical data on an epidemic in 1967 in the town of Abakaliki, Nigeria, afflicting a religious group that refused vaccination. According to the authors' estimates, 79.9% (95% confidence interval (CI): 63.6, 87.9) of the infectious contacts occurred within the compounds of the cases and 93.3% (95% CI: 80.6, 98.8) among compound members and other close contacts. Each case had 0.164 (95% CI: 0, 1.31) sufficiently close contacts on average during the fever period that preceded the rash and 6.87 (95% CI: 4.52, 10.1) sufficiently close contacts during the whole course of infectivity. These results support the widely held belief that smallpox spreads slowly, mainly among close contacts, and that infectivity before the onset of rash was negligible.
PMID: 12851223 [PubMed - indexed for MEDLINE]

4: Am J Epidemiol. 2003 Jul 15;158(2):118-28.
Case isolation and contact tracing can prevent the spread of smallpox.
Eichner M.
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Fears that terrorist groups may have gained access to variola virus have led to widespread discussions on how to prevent the reintroduction of smallpox by vaccination and on the availability of sufficiently large amounts of vaccine. In this paper, the author examines how the spread of smallpox is affected by isolating overt cases and taking their contacts under close surveillance for up to 3 weeks. The author assumes that case detection gradually improves from initially 7 days to 3 days. This intervention should be accompanied by vaccination, but its outcome does not depend on the vaccine's efficacy. It may, therefore, be especially important in controlling outbreaks caused by pathogens
whose immunologic properties have been modified by genetic engineering. Using stochastic computer simulations, the author demonstrates that contact tracing and case isolation can extinguish smallpox outbreaks in highly susceptible populations within less than half a year without causing totals of more than 550 secondary cases per 100 index cases. The author also derives simple approximate expressions that allow prognostication on how efficiently an outbreak can be controlled by the

described measures alone and prediction of the expected number of cases in an outbreak and the number of people that must be taken under surveillance.
PMID: 12851224 [PubMed - indexed for MEDLINE]

5: Am J Health Syst Pharm. 2003 Apr 15;60(8):749-56; quiz 757-8.
Smallpox: a review of clinical disease and vaccination.
Lofquist JM, Weimert NA, Hayney MS.
University of Wisconsin School of Pharmacy, 777 Highland Avenue, Madison, WI 53705, USA.
The clinical course of smallpox infection and the current and future roles of vaccination and strategies for controlling smallpox outbreaks are reviewed. Close personal contact is required for transmission of variola, the DNA virus that causes smallpox. Following an incubation period, infected persons have prodromal symptoms that include high fever, back pain, malaise, and prostration. The eruptive stage is characterized by maculopapular rash that progresses to papules, then vesicles, and then pustules and scab lesions. The mortality rate for smallpox is approximately 30%. Patients having a fever and rash may be confused with having chickenpox. The most effective method for preventing smallpox epidemic progression is vaccination. Until recently, only 15 million doses of smallpox vaccine--manufactured 20 years ago--were available in the United States. The vaccine is a live vaccinia virus preparation administered by scarification with a bifurcated needle. The immune response is protective against orthopoxviruses, including variola. Vaccination is associated with moderate to severe complications, such as generalized vaccinia, eczema vaccinatum, progressive vaccinia, and postvaccinial encephalitis. Efforts for vaccine production are now focused on a live cell-culture-derived vaccinia virus vaccine. Although smallpox was eradicated in 1980, it remains a potential agent for bioterrorism. As a category A biological weapon, its potential to devastate populations causes concern among those in the public health community who have been actively developing plants to deal with smallpox and other potential agents of biological warfare. The only proven effective strategy against smallpox is vaccination.
Publication Types: Review Review, Tutorial
PMID: 12749161 [PubMed - indexed for MEDLINE]

6: Am J Pathol. 2003 Aug;163(2):701-9.
Pathology and pathogenesis of bioterrorism-related inhalational anthrax.
Guarner J, Jernigan JA, Shieh WJ, Tatti K, Flannagan LM, Stephens DS, Popovic T, Ashford DA, Perkins BA, Zaki SR; Inhalational Anthrax Pathology Working Group.
Infectious Diseases Pathology Activity, Division of Viral Rickettsial Diseases, Centers for Disease Control and Prevention, Atlanta, Georgia 30333, USA.
During October and November 2001, public health authorities investigated 11 patients with inhalational anthrax related to a bioterrorism attack in the United States. Formalin-fixed samples from 8 patients were available for pathological and immunohistochemical (IHC) study using monoclonal antibodies against the Bacillus anthracis cell wall and capsule. Prominent serosanguinous pleural effusions and hemorrhagic mediastinitis were found in 5 patients who died. Pulmonary infiltrates seen on chest radiographs corresponded to intraalveolar edema and hyaline membranes. IHC assays demonstrated abundant intra- and extracellular bacilli, bacillary fragments, and granular
antigen-staining in mediastinal lymph nodes, surrounding soft tissues, and pleura. IHC staining in lung, liver, spleen, and intestine was present primarily inside blood vessels and sinusoids. Gram's staining of tissues was not consistently positive. In 3

surviving patients, IHC of pleural samples demonstrated abundant granular antigen-staining and rare bacilli while transbronchial biopsies showed granular antigen-staining in interstitial cells. In surviving patients, bacilli were not observed with gram's stains.
Pathological and IHC studies of patients who died of bioterrorism-related inhalational anthrax confirmed the route of infection. IHC was indispensable for diagnosis of surviving anthrax cases. The presence of B. anthracis antigens in the pleurae could explain the prominent and persistent hemorrhagic pleural effusions.
PMID: 12875989 [PubMed - indexed for MEDLINE]

7: Am J Public Health. 2003 Aug;93(8):1222-6.
Public health, law, and local control: destruction of the US chemical weapons stockpile.
Greenberg MR.
Department of Urban Studies and Community Health, Bloustein School of Planning and Policy, Rutgers University, New Brunswick, NJ 08901-1958, USA.
mrg@rci.rutgers.edu
Destruction of US chemical weapons has begun at one of the 8 sites in the continental United States, was completed on Johnston Island in the Pacific Ocean, and is scheduled to begin in at least 3 other locations during the upcoming year. About 25% of the stockpile and 38% of the munitions had been destroyed as of December 31, 2002. However, the program has become controversial with regard to choice of technology, emergency management, and cost. This controversy is in large part due to efforts by some state and local governments and activist groups to play a more central role in a decision making process that was once fully controlled by the US Army.
PMID: 12893599 [PubMed - indexed for MEDLINE]

8: Am J Public Health. 2003 Aug;93(8):1230-5.
Innovative surveillance methods for rapid detection of disease outbreaks and bioterrorism: results of an interagency workshop on health indicator surveillance.
Pavlin JA, Mostashari F, Kortepeter MG, Hynes NA, Chotani RA, Mikol YB, Ryan MA, Neville JS, Gantz DT, Writer JV, Florance JE, Culpepper RC, Henretig FM, Kelley PW.
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A system designed to rapidly identify an infectious disease outbreak or bioterrorism attack and provide important demographic and geographic information is lacking in most health departments nationwide. The Department of Defense Global Emerging Infections System sponsored a meeting and workshop in May 2000 in which participants discussed prototype systems and developed recommendations for new surveillance systems. The authors provide a summary of the group's findings, including expectations and recommendations for new surveillance systems. The consensus of the group was that a nationally led effort in developing health indicator surveillance methods is needed to promote effective,innovative systems.
PMID: 12893601 [PubMed - indexed for MEDLINE]

9: Am J Public Health. 2003 Aug;93(8):1226-30.
Public health's response to a changed world: September 11, biological terrorism, and the development of an environmental health tracking network.
Marmagas SW, King LR, Chuk MG.

Environmental and Health Program, Physicians for Social Responsibility, Washington, DC 20009, USA. swest@psr.org
Historically, the importance of public health has often been recognized during or as a result of major tragedy. The attacks that occurred in the United States in 2001 are no exception. These events have raised awareness of our vulnerability and the need for emergency preparedness, the need for a flexible and sustainable public health infrastructure, and the importance of linkages between environmental exposures and health outcomes. The authors encourage the public health community, along with policymakers, to develop a national environmental health tracking system that can improve our overall public health capacity and prepare us to investigate the critical issues of the day, whether they be emerging infectious diseases, terrorist attacks, or chronic illnesses.
PMID: 12893600 [PubMed - indexed for MEDLINE]

10: Clin Infect Dis. 2003 Oct 1;37(7):905-11. Epub 2003 Sep 12.
Serious Adverse Events among Participants in the Centers for Disease Control and Prevention's Anthrax Vaccine and Antimicrobial Availability Program for Persons at Risk for Bioterrorism-Related Inhalational Anthrax.
Tierney BC, Martin SW, Franzke LH, Marano N, Reissman DB, Louchart RD, Goff JA, Rosenstein NE, Sever JL, McNeil MM.
Epidemiology Program Office, Centers for Disease Control and Prevention, Atlanta, GA, 30333, USA. (bgt2@cdc.gov)
On 20 December 2001, the Centers for Disease Control and Prevention (CDC) initiated the Anthrax Vaccine and Antibiotic Availability Program (hereafter, the "Program") under an investigational new drug application with the US Food and Drug Administration. This Program provided options for additional preventive treatment for persons at risk for inhalation anthrax as a result of recent bioterrorism attacks who had concluded or were concluding a 60-day course of antimicrobial prophylaxis. Participants were offered an additional 40 days of antibiotic therapy (with ciprofloxacin, doxycycline, or amoxicillin) or
antibiotic therapy plus 3 doses of anthrax vaccine. By 11 February 2002, a total of 5420 persons had received standardized education about the Program and 1727 persons (32%) had enrolled. Twelve participants have been identified as having serious adverse events (SAEs). One SAE, which occurred in a participant with ciprofloxacin-induced allergic interstitial nephritis, was considered to be probably associated with treatment received in the Program. No SAEs were associated with anthrax vaccine. CDC will continue to monitor Program participants during the next 2 years.
PMID: 13130401 [PubMed - in process]

11: Crim Justice Ethics. 2002 Summer;21(2):2, 74-6.
Public health and civil liberties in an era of bioterrorism.
Gostin LO.
Georgetown University, Washington, DC, USA.
PMID: 12956132 [PubMed - indexed for MEDLINE]

12: Drug Discov Today. 2003 Aug 15;8(16):740-5.
Preventive and therapeutic approaches to viral agents of bioterrorism.
Bronze MS, Greenfield RA.

Division of Infectious Diseases, University of Oklahoma Health, Sciences Center and the Oklahoma City, Veterans Administration Medical Center, Oklahoma City, USA. Michael-Bronze@ouhsc.edu
Certain viruses, such as those that cause smallpox and hemorrhagic fevers, have been identified as possible bioterrorism agents by the Centers for Disease Control and Prevention. They have been designated as potential threats because large quantities can be propagated in cell culture, they are transmissible as aerosols and, for the most part, there are only limited vaccine and pharmaceutical strategies for either prevention or treatment of established infection. An additional concern is the potential to genetically modify these agents to enhance virulence or promote resistance to vaccines or identified
antivirals. Although the major impact of these agents is human illness, the release of zoonotic agents, such as the Nipah virus, would have consequences for both humans and animals because infected and noninfected animals might need to be sacrificed to control the spread of infection. Continued research is necessary to develop effective strategies to limit the impact of these biological threats.
Publication Types: Review Review, Tutorial
PMID: 12944096 [PubMed - indexed for MEDLINE]

13: Emerg Infect Dis. 2003 Jun;9(6):689-96.
Isolated case of bioterrorism-related inhalational anthrax, New York City, 2001.
Holtz TH, Ackelsberg J, Kool JL, Rosselli R, Marfin A, Matte T, Beatrice ST, Heller MB, Hewett D, Moskin LC, Bunning ML, Layton M.
Centers for Disease Control and Prevention, Atlanta, Georgia, USA. tkh3@cdc.gov
On October 31, 2001, in New York City, a 61-year-old female hospital employee who had acquired inhalational anthrax died after a 6-day illness. To determine sources of exposure and identify additional persons at risk, the New York City
Department of Health, Centers for Disease Control and Prevention, and law enforcement authorities conducted an extensive investigation, which included interviewing contacts, examining personal effects, summarizing patient's use of mass transit, conducting active case finding and surveillance near her residence and at her workplace, and collecting samples from co-workers and the environment. We cultured all specimens for Bacillus anthracis. We found no additional cases of cutaneous or inhalational anthrax. The route of exposure remains unknown. All environmental samples were negative for B. anthracis. This first case of inhalational anthrax during the 2001 outbreak with no apparent direct link to contaminated mail emphasizes the need for close coordination
between public health and law enforcement agencies during bioterrorism-related investigations.
PMID: 12781008 [PubMed - indexed for MEDLINE]

14: Emerg Infect Dis. 2003 Jun;9(6):681-8.
Bioterrorism-related inhalational anthrax in an elderly woman, Connecticut, 2001.
Griffith KS, Mead P, Armstrong GL, Painter J, Kelley KA, Hoffmaster AR, Mayo D, Barden D, Ridzon R, Parashar U, Teshale EH, Williams J, Noviello S, Perz JF, Mast EE, Swerdlow DL, Hadler JL.
Centers for Disease Control and Prevention, Atlanta, Georgia, USA. kkg8@cdc.gov
On November 20, 2001, inhalational anthrax was confirmed in an elderly woman from rural Connecticut. To determine her exposure source, we conducted an extensive epidemiologic, environmental, and laboratory investigation. Molecular subtyping showed that her isolate was indistinguishable from isolates associated with

intentionally contaminated letters. No samples from her home or community yielded Bacillus anthracis, and she received no first-class letters from facilities known to have processed intentionally contaminated letters. Environmental sampling in the regional Connecticut postal facility yielded B. anthracis spores from 4 (31%) of 13 sorting machines. One extensively contaminated machine primarily processes bulk mail. A second machine that does final sorting of bulk mail for her zip code yielded B. anthracis on the column of bins for her carrier route. The evidence suggests she was exposed through a cross-contaminated bulk mail letter. Such cross-contamination of letters and postal facilities has implications for managing the response to future B. anthracis-contaminated mailings.
PMID: 12781007 [PubMed - indexed for MEDLINE]

15: Emerg Infect Dis. 2003 Jun;9(6):615-22.
An ounce of prevention is a ton of work: mass antibiotic prophylaxis for anthrax, New York City, 2001.
Blank S, Moskin LC, Zucker JR.
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Protocols for mass antibiotic prophylaxis against anthrax were under development in New York City beginning in early 1999. This groundwork allowed the city's Department of Health to rapidly respond in 2001 to six situations in which cases were identified or anthrax spores were found. The key aspects of planning and lessons learned from each of these mass prophylaxis operations are reviewed. Antibiotic distribution was facilitated by limiting medical histories to issues relevant to prescribing prophylactic antibiotic therapy, formatting medical records to facilitate rapid decision making, and separating each component activity into discrete work stations. Successful implementation of mass
prophylaxis operations was characterized by clarity of mission and eligibility criteria, well-defined lines of authority and responsibilities, effective communication, collaboration among city agencies (including law enforcement), and coordination of staffing and supplies. This model can be adapted for future planning needs including possible attacks with other bioterrorism agents, such as smallpox.
Publication Types: Review Review, Tutorial
PMID: 12780998 [PubMed - indexed for MEDLINE]

16: Emerg Infect Dis. 2003 Jun;9(6):708-12.
Community reaction to bioterrorism: prospective study of simulated outbreak.
DiGiovanni C Jr, Reynolds B, Harwell R, Stonecipher EB, Burkle FM Jr.
National Naval Medical Center, Bethesda, Maryland, USA. cdig@july.dgsys.com
To assess community needs for public information during a bioterrorism-related crisis, we simulated an intentional Rift Valley fever outbreak in a community in the southern part of the United States. We videotaped a series of simulated print and television "news reports" over a fictional 9-day crisis period and invited various groups (e.g., first-responders and their spouses or partners, journalists) within the selected community to view the videotape and respond to questions about their reactions. All responses were given anonymously. First-responders and their spouses or partners varied in their reactions about how the crisis affected family harmony and job performance. Local journalists exhibited considerable personal fear and confusion. All groups demanded, and put more trust in, information from local sources. These findings may have implications for risk communication during bioterrorism-related outbreaks.

PMID: 12781011 [PubMed - indexed for MEDLINE]

17: Expert Rev Mol Diagn. 2003 Sep;3(5):605-16.
Molecular diagnostic techniques for use in response to bioterrorism.
Firmani MA, Broussard LA.
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The use of micro-organisms as agents of biological warfare is considered inevitable for several reasons, including ease of production and dispersion, delayed onset of symptoms, ability to cause high rates of morbidity and mortality and difficulty in diagnosis. Therefore, the clinical presentation and pathogenesis of the organisms posing the highest threat (variola major, Bacillus anthracis, Yersinia pestis, Clostridium botulinum toxin, Francisella tularensis, filoviruses, arenaviruses and Brucella species), as well as the available diagnostic techniques and treatments for such infections, will be reviewed in this article. Due to the necessity of rapid identification and diagnosis, molecular techniques have been the ongoing focus of current research. Consequently, the molecular diagnostic techniques that have recently been developed for the diseases associated with these agents will be emphasized.
PMID: 14510181 [PubMed - in process]

18: Expert Rev Vaccines. 2002 Jun;1(1):5.
NIH study supports diluting smallpox vaccine stockpile.
[No authors listed]
Publication Types: News
PMID: 12908505 [PubMed - indexed for MEDLINE]

19: J Am Dent Assoc. 2003 Jun;134(6):745-52.
Bioterrorism and catastrophe response: a quick-reference guide to resources.
Han SZ, Alfano MC, Psoter WJ, Rekow ED.
Harvard School of Dental Medicine, Boston, USA.
BACKGROUND: Dentists' responses to catastrophe have been redefined by bioterrorism. Informed response requires accurate information about agents and diseases that have the potential to be used as weapons. METHODS: The authors reviewed information about the most probable bioterrorist weapons (those from the Center for Disease Control and Prevention's Category A) from the World Wide Web and print journals and distilled it into a resource list that is current, relevant to dentistry and noncommercial. The Web sites cited include those sponsored by federal agencies, academic institutions and professional organizations. The articles cited include those published in English within the last six years in refereed journals that are available in most higher education institutions. RESULTS: The authors present the information in a table that provides a quick-reference guide to resources describing agents and diseases
with the greatest potential for use as weapons: anthrax, botulism, plague, smallpox, tularemia and viral hemorrhagic fevers. This article presents Web site and journal citations for background and patient-oriented information (fact sheets), signs and symptoms, and prophylactic measures and treatment for each of the agents and diseases. The table facilitates quick access to this information, especially in an emergency. This article also points out guidelines for response should a suspected

attack occur. CONCLUSIONS: Armed with information about biological weapons, dentists can provide faster diagnosis, inform their patients about risks, prophylaxis or treatment and rethink their own role in terrorism response. CLINICAL IMPLICATIONS: Fast, accurate diagnosis limits the spread of exceptionally contagious diseases. Providing accurate information to patients minimizes misinformation and the associated public fear and panic that, unchecked, could overwhelm health care systems.
Publication Types: Review Review, Tutorial
PMID: 12839411 [PubMed - indexed for MEDLINE]

20: J Healthc Prot Manage. 2003 Summer;19(2):55-61.
Protecting HVAC systems from bio-terrorism.
Arterburn T.
The FBI, in the wake of the September 11 attacks, issued an advisory to state and local law enforcement authorities and the public asking to remain especially alert to any unusual activities around ventilation systems. It noted that while the Bureau possessed no specific threats regarding the release of toxic chemicals into air handling systems, building owners and managers should be well-aware of the potential for contamination of such systems. This article presents recommendations of air-handling experts and associations for operators to consider.
PMID: 12921015 [PubMed - indexed for MEDLINE]

21: J Med Philos. 2003 Jun;28(3):339-57.
Holding civic medicine accountable: will Morreim's liability scheme work in a disaster?
Trotter G.
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In Holding Health Care Accountable, E. Haavi Morreim differentiates between duties of expertise and resource duties, arguing for tort liability respecting the former and contract liability respecting the latter. Though Morreim's book addresses ordinary clinical medicine, her liability scheme may also be relevant elsewhere. Focusing on disaster medicine, and especially the medical management of violent mass disasters (e.g., where terrorists have deployed weapons of mass destruction), I argue in this essay that Morreim's classification of duties still fits, but that it is difficult to hold government powers accountable for their many resource and expertise duties. This difficulty is compounded by political arrangements that foist under-funded mandates for disaster services on healthcare providers. As a result of such arrangements, hospitals and clinicians are prone to liability for expenditures and clinical interventions that are beyond their scope. This problem can be mitigated, I argue, by examining and clarifying the apparent social compact between society and healthcare.
PMID: 12815537 [PubMed - indexed for MEDLINE]

22: J Nerv Ment Dis. 2003 Jul;191(7):431-6.
Belief in exposure to terrorist agents: reported exposure to nerve or mustard gas by Gulf War veterans.
Stuart JA, Ursano RJ, Fullerton CS, Norwood AE, Murray K.
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September 11 brought increased awareness that even the threat of chemical and biological terrorism can overwhelm this country's health care system. Belief in exposure to toxic agents, even when none is documented, is not uncommon in crisis and merits vigilant health care evaluation and services. This study examined risk factors (demographics, physical symptoms, clinical diagnosis, exposures, and health status) for belief in exposure to potential terrorist agents (nerve or mustard gas) using a large sample of Gulf War veterans who reported belief in exposure to nerve or mustard gas. We found that females, nonwhites, and those who were older (age 32 to 61 years) were more likely to report exposure. When adjusting for demographics and military service, these veterans reported more exposures (nonnerve or mustard gas) to potentially toxic
agents and traumatic events (odds ratio [OR], 6.80; p<.001), reported more physical symptoms during the Gulf War (OR, 2.38; p<.001), were more likely to be diagnosed with a mental disorder (OR, 1.72; p<.001), and reported poorer current health status (OR, 3.47 to 1.22; p<.001). Not unlike previously reported studies of disasters, traumatic exposures, or risk exposures, belief in exposure to toxic agents suggests that certain people are at a greater health care risk. This knowledge will aid in better responding to rapid demands that may be placed on our health care delivery systems in times of potential terrorist activity.
PMID: 12891089 [PubMed - indexed for MEDLINE]

23: J Urban Health. 2003 Jun;80(2 Suppl 1):i1-140.
BioTerrorism--Syndromic Surveillance. Proceedings of the 2002 National Syndromic Surveillance Conference. New York, USA, September 23-24, 2002.
[No authors listed]
Publication Types: Congresses Overall
PMID: 14509977 [PubMed - indexed for MEDLINE]

24: J Urban Health. 2003 Jun;80(2 Suppl 1):i1-7.
Syndromic surveillance: a local perspective.
Mostahari F, Hartman J.
Publication Types: Editorial
PMID: 12892064 [PubMed - indexed for MEDLINE]

25: J Urban Health. 2003 Jun;80(2 Suppl 1):i8-13.
Draft framework for evaluating syndromic surveillance systems.
Sosin DM.
Division of Public Health Surveillance and Informatics, Centers for Disease Control and Prevention, Atlanta, GA 30341, USA.
Interest in public health surveillance to detect outbreaks from terrorism is driving the exploration of nontraditional data sources and development of new performance priorities for surveillance systems. A draft framework for evaluating syndromic surveillance systems will help researchers and public health practitioners working on nontraditional surveillance to review their work in a systematic way and communicate their efforts. The framework will also guide public health practitioners in their efforts to compare and contrast aspects of syndromic surveillance systems and decide whether and how to develop and maintain such systems. In addition, a common framework will allow the identification and prioritization of research and

evaluation needs. The evaluation framework is comprised of five components: a thorough description of the system (e.g., purpose, stakeholders, how the system works); system performance experience (e.g., usefulness, acceptability to stakeholders, generalizability to other settings, operating stability, costs); capacity for outbreak detection (e.g., flexibility to adapt to changing risks and data inputs, sensitivity to detect outbreaks, predictive value of system alarms for true outbreaks, timeliness of detection); assessment of data quality (e.g., representativeness of the population covered by the system, completeness of data capture, reliability of data captured over time); and conclusions and recommendations. The draft framework is intended to evolve into guidance to support public health practice for terrorism preparedness and outbreak detection.
PMID: 12791773 [PubMed - indexed for MEDLINE]

26: J Urban Health. 2003 Jun;80(2 Suppl 1):i25-31.
Syndromic surveillance using minimum transfer of identifiable data: the example of the National Bioterrorism Syndromic Surveillance Demonstration Program.
Platt R, Bocchino C, Caldwell B, Harmon R, Kleinman K, Lazarus R, Nelson AF, Nordin JD, Ritzwoller DP.
Department of Ambulatory Care and Prevention, Harvard Medical School, Boston, Massachusetts 02215, USA. richard.platt@channing.harvard.edu
Several health plans and other organizations are collaborating with the Centers for Disease Control and Prevention to develop a syndromic surveillance system with national coverage that includes more than 20 million people. A principal design feature of this system is reliance on daily reporting of counts of individuals with syndromes of interest in specified geographic regions rather than reporting of individual encounter-level information. On request from public health agencies, health plans and telephone triage services provide additional information regarding individuals who are part of apparent clusters of illness. This reporting framework has several advantages, including less sharing of protected health information, less risk that confidential information will be distributed inappropriately, the prospect of better public acceptance, greater acceptance by health plans, and less effort and cost for both health plans and public health agencies. If successful, this system will allow any organization with appropriate data to contribute vital information to public health syndromic surveillance systems while preserving individuals' privacy to the greatest extent possible.
PMID: 12791776 [PubMed - indexed for MEDLINE]

27: J Urban Health. 2003 Jun;80(2 Suppl 1):i32-42.
A systems overview of the Electronic Surveillance System for the Early Notification of Community-Based Epidemics (ESSENCE II).
Lombardo J, Burkom H, Elbert E, Magruder S, Lewis SH, Loschen W, Sari J, Sniegoski C, Wojcik R, Pavlin J.
The Johns Hopkins University Applied Physics Laboratory, Laurel, MD 20723, USA. Joseph.Lombardo@jhuapl.edu
The Electronic Surveillance System for the Early Notification of Community-Based Epidemics, or ESSENCE II, uses syndromic and nontraditional health information to provide very early warning of abnormal health conditions in the National Capital Area (NCA). ESSENCE II is being developed for the Department of Defense Global Emerging Infections System and is the only known system to combine both military and civilian health care information for daily outbreak surveillance. The National

Capital Area has a complicated, multijurisdictional structure that makes data sharing and integrated regional surveillance challenging. However, the strong military presence in all jurisdictions facilitates the collection of
health care information across the region. ESSENCE II integrates clinical and nonclinical human behavior indicators as a means of identifying the abnormality as close to the time of onset of symptoms as possible. Clinical data sets include emergency room syndromes, private practice billing codes grouped into syndromes, and veterinary syndromes. Nonclinical data include absenteeism, nurse hotline calls, prescription medications, and over-the-counter self-medications. Correctly using information marked by varying degrees of uncertainty is one of the more challenging aspects of this program. The data (without personal identifiers) are captured in an electronic format, encrypted, archived, and processed at a secure facility. Aggregated information is then provided to users on secure Web sites. When completed, the system will provide automated capture, archiving, processing, and notification of abnormalities to epidemiologists and analysts. Outbreak detection methods currently include temporal and spatial variations of odds ratios, autoregressive modeling, cumulative summation,
matched filter, and scan statistics. Integration of nonuniform data is needed to increase sensitivity and thus enable the earliest notification possible. The performance of various detection techniques was compared using results obtained from the ESSENCE II system.
Publication Types: Review Review, Tutorial
PMID: 12791777 [PubMed - indexed for MEDLINE]

28: J Urban Health. 2003 Jun;80(2 Suppl 1):i76-88.
Enhanced drop-in syndromic surveillance in New York City following September 11, 2001.
Das D, Weiss D, Mostashari F, Treadwell T, McQuiston J, Hutwagner L, Karpati A, Bornschlegel K, Seeman M, Turcios R, Terebuh P, Curtis R, Heffernan R, Balter S.
Syndromic Surveillance, New York City Department of Health, New York, New York 10013. ddas@healthy.nyc.gov
After the 2001 World Trade Center disaster, the New York City Department of Health was under heightened alert for bioterrorist attacks in the city. An emergency department (ED) syndromic surveillance system was implemented with the assistance of the Centers for Disease Control and Prevention to ensure early recognition of an increase or clustering of disease syndromes that might represent a disease outbreak, whether natural or intentional. The surveillance system was based on data collected 7 days a week at area EDs. Data collected were translated into syndromes, entered into an electronic database, and analyzed for aberrations in space and time within 24 hours. From September 14-27, personnel were stationed at 15 EDs on a 24-hour basis (first staffing period); from September 29-October 12, due to resource limitations, personnel were stationed at 12 EDs on an 18-hour basis (second staffing period). A standardized form was used to obtain demographic information and classify each patient visit into 12 syndrome categories. Seven of these represented early manifestations of bioterrorist agents. Data transfer and analysis for time and space clustering (alarms) by syndrome and age occurred daily. Retrospective analyses examined syndrome trends, differences in reporting between staffing periods, and the staff's experience during the project. A total of 67,536 reports were received. The system captured 83.9% of patient visits during the first staffing period, and 60.8% during the second staffing period ($P < 0.01$). Five syndromes each accounted for more than 1% of visits: trauma, asthma, gastrointestinal illness, upper/lower respiratory infection with fever, and anxiety.

Citywide temporal alarms occurred eight times for three of the major bioterrorism-related syndromes. Spatial clustering alarms occurred 16 times by hospital location and 9 times by ZIP code for the same three syndromes. No outbreaks were detected. On-site staffing to facilitate data collection and entry, supported by daily analysis of ED visits, is a feasible short-term approach to syndromic surveillance during high-profile events. The resources required to operate such a system, however, cannot be sustained for the long term. This system was changed to an electronic-based ED syndromic system using triage log data that remains in operation.
PMID: 12791782 [PubMed - indexed for MEDLINE]

29: J Urban Health. 2003 Jun;80(2 Suppl 1):i89-96.
The bioterrorism preparedness and response Early Aberration Reporting System (EARS).
Hutwagner L, Thompson W, Seeman GM, Treadwell T.

Bioterrorism Preparedness and Response, Centers for Disease Control and Prevention, Atlanta, Georgia 30333. Lhutwagner@cdc.gov
Data from public health surveillance systems can provide meaningful measures of population risks for disease, disability, and death. Analysis and evaluation of these surveillance data help public health practitioners react to important health events in a timely manner both locally and nationally. Aberration detection methods allow the rapid assessment of changes in frequencies and rates of different health outcomes and the characterization of unusual trends or clusters. The Early Aberration Reporting System (EARS) of the Centers for Disease Control and Prevention allows the analysis of public health surveillance data using available aberration detection methods. The primary purpose of EARS is to provide national, state, and local health departments with several
alternative aberration detection methods. EARS helps assist local and state health officials to focus limited resources on appropriate activities during epidemiological investigations of important public health events. Finally, EARS allows end users to select validated aberration detection methods and modify sensitivity and specificity thresholds to values considered to be of public health importance by local and state health departments.
PMID: 12791783 [PubMed - indexed for MEDLINE]

30: J Urban Health. 2003 Jun;80(2 Suppl 1):i97-106.
Syndromic surveillance using automated collection of computerized discharge diagnoses.
Lober WB, Trigg LJ, Karras BT, Bliss D, Ciliberti J, Stewart L, Duchin JS.
Clinical Informatics Research Group, University of Washington, Seattle, WA 98195, USA. lober@u.washington.edu
The Syndromic Surveillance Information Collection (SSIC) system aims to facilitate early detection of bioterrorism attacks (with such agents as anthrax, brucellosis, plague, Q fever, tularemia, smallpox, viral encephalitides, hemorrhagic fever, botulism toxins, staphylococcal enterotoxin B, etc.) and early detection of naturally occurring disease outbreaks, including large foodborne disease outbreaks, emerging infections, and pandemic influenza. This is accomplished using automated data collection of visit-level discharge diagnoses from heterogeneous clinical information systems, integrating those
data into a common XML (Extensible Markup Language) form, and monitoring the results to detect unusual patterns of illness in the population. The system,

operational since January 2001, collects, integrates, and displays data from three emergency department and urgent care (ED/UC) departments and nine primary care clinics by automatically mining data from the information systems of those facilities. With continued development, this system will constitute the foundation of a population-based surveillance system that will facilitate targeted investigation of clinical syndromes under surveillance and allow early detection of unusual clusters of illness compatible with bioterrorism or disease outbreaks.
PMID: 12791784 [PubMed - indexed for MEDLINE]

31: J Vet Med Educ. 2003 Summer;30(2):96-104.
US agriculture is vulnerable to bioterrorism.
Moon HW, Kirk-Baer C, Ascher M, Cook RJ, Franz DR, Hoy M, Husnik DF, Jensen HH, Keller KH, Lederberg J, Madden LV, Powers LS, Steinberg AD, Strating A, Smith RE, Kuzma J, Grossblatt N, Holliday L, Sweatt D, Strongin S.
Veterinary Medical Research Institute, Iowa State University, USA
PMID: 12970850 [PubMed - in process]

32: JAMA. 2003 Sep 10;290(10):1306-7.
Emerging infections and bioterrorism raise profile of schools of public health.
Lovinger SP.
Publication Types: News
PMID: 12966108 [PubMed - indexed for MEDLINE]

33: Lancet Neurol. 2002 Dec;1(8):459.
Chemical weapons--shifting the goal posts.
[No authors listed]
PMID: 12849309 [PubMed - indexed for MEDLINE]

34: Med Health R I. 2003 Jul;86(7):201-3.
Biodefense: medicine in the time of bioterrorism.
Artenstein AW.
Center for Biodefense and Emerging Pathogens, Division of Infectious Diseases, Memorial Hospital of RI, 111 Brewster St., Pawtucket, RI 02860, USA.
artenstein@brown.edu
PMID: 12973895 [PubMed - in process]

35: Mil Med. 2003 Jul;168(7):520-2.
Anthrax refusers: a 2nd infantry division perspective.
Staudenmeier JJ, Bacon BL, Ruiz RT, Diebold CJ.
Department of Psychiatry, Tripler Army Medical Center, 1 Jarrett White Road, Honolulu, HI 96859, USA.
The Department of Defense anthrax vaccination program has been in the news often recently. Concerns are cited over the safety and usefulness of the vaccine. This brief report describes some of the characteristics of anthrax vaccine refusers. This report examines the implementation of an anthrax vaccination program in a well-disciplined, forward-deployed Army unit facing a hostile enemy with access to anthrax biological warfare stocks.
PMID: 12901458 [PubMed - indexed for MEDLINE]

36: MLO Med Lab Obs. 2003 Aug;35(8):12-7, 19; quiz 22-3.
Sentinel bioterrorism responders: are hospital labs ready?
York M.
PMID: 12942658 [PubMed - indexed for MEDLINE]

37: N C Med J. 2002 Sep-Oct;63(5):257-64.
Preparing for bioterrorism in North Carolina.
Cline JS.
Epidemiology Section and Bioterrorism, North Carolina Division of Public Health, USA. steve.cline@ncmail.net
PMID: 12970969 [PubMed - in process]

38: N C Med J. 2002 Sep-Oct;63(5):265-7.
The challenge of training a public health workforce in bioterrorism preparedness.
Ryder RW.
Schools of Medicine and Public Health, University of North Carolina at Chapel Hill, USA. RobertRyder@unc.edu
PMID: 12970970 [PubMed - in process]

39: N C Med J. 2002 Sep-Oct;63(5):268-70.
Bioterrorism, the public's health, and the law.
Moore J.
Public Law & Government, School of Government, University of North Carolina at Chapel Hill, USA. moore@iogmail.iog.unc.edu
PMID: 12970971 [PubMed - in process]

40: N C Med J. 2002 Sep-Oct;63(5):271-3.
Anthrax scare in Buncombe County. A lesson in the basics of bioterrorism preparedness.
Bond GF Jr.
Buncombe County Health Center, Asheville, USA. george.bond@buncombecounty.org
PMID: 12970972 [PubMed - in process]

41: N J Med. 2003 Jul-Aug;100(7-8):47; author reply 47.
State epidemiologist, Eddy Bresnitz, MD, MS, on bioterrorism.
Porwancher R.
Publication Types: Letter
PMID: 12955807 [PubMed - in process]

42: Nat Biotechnol. 2003 Mar;21(3):216.
US budget/Bioshield initiative emphasizes bioterrorism countermeasures.
Fox JL.
Publication Types: News
PMID: 12610554 [PubMed - indexed for MEDLINE]

43: Nature. 2003 Sep 11;425(6954):110.

US selects regional biodefence hubs.
Dalton R.
Publication Types: News
PMID: 12968137 [PubMed - indexed for MEDLINE]

44: Public Health Rep. 2003 Sep-Oct;118(5):477-9.
Public health emergencies and legal reform: implications for public health policy and practice.
Gostin LO, Hodge JG Jr.
The Faculties of Georgetown University Law Center and the Johns Hopkins Bloomberg School of Public Health, USA
PMID: 12941861 [PubMed - indexed for MEDLINE]
45: Science. 2003 Sep 26;301(5641):1852-3.
PUBLIC HEALTH: Building Microbial Forensics as a Response to Bioterrorism.
Budowle B, Schutzer SE, Einseln A, Kelley LC, Walsh AC, Smith JA, Marrone BL, Robertson J, Campos J.
Combating bioterrorism is a challenge to all of us. To be proactive, the U.S. Government has formalized the discipline of "microbial forensics" to deter and attribute perpetrators of such acts. This Policy Forum describes the foundations of the microbial forensics program: the creation of a national bioforensics laboratory, a partnership laboratory network, and a peer-consensus scientific working group and the promulgation of quality assurance guidelines.
PMID: 14512607 [PubMed - in process]

46: Science. 2003 Aug 15;301(5635):912-3.
Thomas Monath profile. Riding the biodefense wave.
Enserink M.
Publication Types: Biography Historical Article News
Personal Name as Subject: Monath T
PMID: 12920279 [PubMed - indexed for MEDLINE]

47: Semin Respir Infect. 2003 Sep;18(3):206-15.
Ebola hemorrhagic fever in the era of bioterrorism.
Polesky A, Bhatia G.
Viral hemorrhagic fevers are among a small group of infectious diseases considered potential candidates for use as agents of bioterrorism. Ebola hemorrhagic fever, the focus of this article, has the highest mortality rate of the viral hemorrhagic fevers and has no effective treatment. It is transmitted easily to family members and health care professionals not following universal precautions. The history of this infection, its clinical presentation, and epidemiology are discussed. Attention is paid to the immunopathogenesis of the disease with a focus on pulmonary involvement. Recommendations for infection control and Ebola virus' potential as a bioterrorism agent are addressed.
PMID: 14505282 [PubMed - in process]

48: Semin Respir Infect. 2003 Sep;18(3):133.
Introduction: The respiratory agents of bioterrorism.
Jensen WA.
PMID: 14505275 [PubMed - in process]

49: Semin Respir Infect. 2003 Sep;18(3):134-45.
When bioterrorism strikes: Diagnosis and management of inhalational anthrax.
Shafazand S.

In October and November, 2001, reports of patients with inhalational anthrax reacquainted the public with this ancient disease and introduced the harsh reality of a bioterrorist act. Bacillus anthracis, a rod-shaped, spore-forming bacterium, primarily infects herbivores. Humans traditionally have acquired the disease from occupational or agricultural exposure to infected animals and animal products. Recent events saw the intentional release of anthrax spores, using the U.S. postal system as an unlikely and unwilling agent. Cutaneous disease, pulmonary disease, and gastrointestinal anthrax are the known clinical manifestations of anthrax. Inhalational anthrax has the highest mortality and is the main focus of this report.
PMID: 14505276 [PubMed - in process]